Final

Site-Specific Field Sampling Plan, Site-Specific Safety and Health Plan, and Site-Specific Unexploded Ordnance Safety Plan Attachments Range I, Parcel 201(7) Fort McClellan, Calhoun County, Alabama

Prepared for:

U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
Mobile, Alabama 36602

Prepared by:

IT Corporation
312 Directors Drive
Knoxville, Tennessee 37923

Task Order CK05
Contract No. DACA21-96-D-0018
IT Project No. 774645

February 2001

Revision 1

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Table of Contents

Page

Table of Contents *(Continued)*

Page

List of Tables

List of Figures

List of Acronyms

See Attachment 1 - List of Abbreviations and Acronyms.

Executive Summary

In accordance with Contract Number DACA21-96-D-0018, Task Order CK05, IT Corporation (IT) will conduct site investigation activities at Range I, Parcel 201(7), on Pelham Range at Fort McClellan, Calhoun County, Alabama, to determine the presence or absence of potential site-specific chemicals. The purpose of this site-specific field sampling plan is to provide technical guidance for sampling activities at Range I, Parcel 201(7).

Range I, Parcel 201(7), is located within Training Area 10A in the western area of Pelham Range. Due to conflicting reports, the exact acreage of Range I is unknown; it is estimated to be 0.5 to 1.0 acre. Range I was reportedly used for both agent shell tapping and area-denial/decontamination exercises from 1963 to 1964. The site is fenced and posted, but the fence was in disrepair during the environmental baseline survey site visit (Environmental Science and Engineering, Inc., 1998). An IT 2000 site reconnaissance of Range I identified several mounds and depressions of unknown origins.

Range I was reportedly used for both agent shell tapping and area-denial/decontamination exercises. However, there have been accounts that there are two Range I's and the reported agent shell tapping activities likely occurred at the AAD Shell Tapping Area.

It is reported that area-denial/decontamination exercises were held at Range I. During the exercises, 40 one-gallon chemical land mines consisting of lewisite-filled 1-gallon metal cans were detonated. Upon completion of the exercise, the area was decontaminated using M3A2 truck-mounted decontamination equipment to dispense lime slurry. Subsequent to site decontamination, a chain-link fence was erected around the area; however, the area decontamination exercise reportedly occupied a larger acreage than that within the existing fenced area.

IT will collect ten surface soil samples, ten subsurface soil samples, four groundwater samples, three surface water samples, and three sediment samples at this site. Potential contaminant sources at Range I, Parcel 201(7), are primarily unknown. Chemical analyses of the samples collected during the field program will include volatile organic compounds, semivolatile organic compounds, nitroexplosives, and metals. In addition, sediment samples will be analyzed for total organic carbon and grain size. Results from these analyses will be compared with both site-specific screening levels and ecological screening values, as presented in the IT July 2000 *Final*

Human Health and Ecological Screening Values and PAH Background Summary Report and regulatory agency guidelines.

Range I, Parcel 201(7), falls within Pelham Range, which is an active range. Therefore, unexploded ordnance (UXO) surface sweeps and downhole surveys of soil borings will be required to support field activities. The surface sweeps and downhole surveys will be conducted to identify anomalies for the purpose of UXO avoidance.

This site-specific field sampling plan attachment to the installation-wide sampling and analysis plan (SAP) for Range I, Parcel 201(7), will be used in conjunction with the site-specific safety and health plan, the site-specific UXO safety plan, the installation-wide work plan, and the SAP. The SAP includes the installation-wide safety and health plan, waste management plan, ordnance and explosives management plan, and quality assurance plan. Site-specific hazard analyses are included in the site-specific safety and health plan and the site-specific UXO safety plan.

1.0 Project Description

1.1 Introduction

The U.S. Army is conducting studies of the environmental impact of suspected contaminants at Fort McClellan (FTMC) in Calhoun County, Alabama, under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE has contracted IT Corporation (IT) to provide environmental services for the site investigation (SI) of Range I, Parcel 201(7), under Task Order CK05, Contract Number DACA21-96-D-0018.

This site-specific field sampling plan (SFSP) attachment to the installation-wide sampling and analysis plan (SAP) (IT, 2000a) for FTMC has been prepared to provide technical guidance for sample collection and analysis at Range I, Parcel 201(7). This SFSP will be used in conjunction with the site-specific safety and health plan (SSHP) and the site-specific unexploded ordnance (UXO) safety plan developed for Range I, Parcel 201(7), and the installation-wide work plan (WP) (IT, 1998) and SAP. The SAP includes the installation-wide safety and health plan, waste management plan, ordnance and explosives management plan, and quality assurance plan (QAP). Site-specific hazard analyses are included in the SSHP and the site-specific UXO safety plan.

1.2 Site Description

Range I, Parcel 201(7), is located within Training Area 10A in the western region of Pelham Range (Figure 1-1). The size of Range I has been reported as being from 0.5 to 1.0 acre. The site is fenced and posted, but the fence was in disrepair during the environmental baseline survey (EBS) site visit (Environmental Science and Engineering, Inc. [ESE], 1998) (Figure 1-2). The fenced area, which is approximately 1.0 acre, is the focus of IT's site investigation.

Range I was reportedly used for both agent shell tapping and area-denial/decontamination exercises from 1963 to 1964. However, there have been accounts that there are two Range I's and the reported agent shell tapping activities likely occurred at the AAD Shell Tapping Area (U.S. Army Center for Health Promotion and Preventive Medicine [CHPPM], 1999).

Retired personnel report conducting area-denial/decontamination exercises at this general location. Forty 1-gallon chemical land mines, consisting of lewisite-filled 1-gallon metal cans, were detonated during one exercise. The area was decontaminated using M3A2 truck-mounted decontamination equipment to dispense lime slurry. A chain-link fence was erected around the

area after decontamination training was completed. However, area decontamination exercises reportedly occupied a larger acreage than that within the existing fenced area (ESE, 1998).

A previous investigation by Roy F. Weston, Inc. (1990) reports that the top 2 feet of soil had been removed to an unknown location. There is not any available date of excavation, volume of soil removed, or reference provided in the report. However, a draft report by the CHPPM states that there was visual evidence of earthwork in a 1977 photograph of Range I (CHPPM, 1999; U.S. Army Toxic and Hazardous Materials Agency, 1977). In addition, Range I was described as a location with "possible hot disposal pits;" however, no definition of hot disposal pits was provided (U.S. Army Toxic and Hazardous Materials Agency, 1977).

During site reconnaissance conducted by IT in 2000, several mounds and depressions were observed. The origin of the mounds and depressions is unknown but may be related to the earthwork activity conducted at the site.

The elevation of the site varies between approximately 535 and 545 feet (National Geodetic Vertical Datum of 1929). Surface water at the site appears to drain to the south and east toward an unnamed stream that flows southwest to Cane Creek. Local shallow groundwater direction at the site is probably influenced by topography; therefore, groundwater flow direction in the residuum is likely to the south and east toward the unnamed tributary of Cane Creek.

Soils at Range I, Parcel 201(7), are made up of soil from the Rarden Series, which is part of the Rarden, Montevallo, and Lehew Association. The Rarden Series consists of moderately well drained, strongly acidic to very strongly acidic soils that generally form in large areas on wide shale ridges having slopes of 2 to 10 percent. The Rarden Series soils developed from the residuum of shale and fine grained platy sandstone or limestone. The Rarden, Montevallo, and Lehew Association of soil covers approximately 17 percent of Calhoun County, primarily in the northern and western portions. The Rarden Series soils alone comprise approximately 40 percent of the Association (U.S. Department of Agriculture, 1961).

According to the U.S. Department of Agriculture (1961), the soil at the site is classified as Rarden gravelly loam, 6 to 10 percent slopes. This soil, distinguished from the Rarden silt loam, 6 to 10 percent slopes, has a gravelly, coarser textured surface soil and slightly higher rate of infiltration. Sandstone, quartz, or chert gravel up to 3 inches in diameter are commonly found on and in the soil of the Rarden gravelly loam. A few places have been slightly to severely eroded, with shallow gullies being common.

1.3 Scope of Work

The scope of work for activities associated with the SI at Range I, Parcel 201(7), as specified by the statement of work (USACE, 2000), includes the following tasks:

- Develop the SFSP attachment.
- Develop the SSHP attachment.
- Conduct a surface and near-surface UXO survey over all areas to be included in the sampling effort.
- Provide downhole UXO support for all intrusive drilling to determine buried downhole hazards.
- Perform a geophysical survey.
- Collect ten surface soil samples, ten subsurface soil samples, four groundwater samples, three surface water samples, and three sediment samples to determine whether potential site-specific chemicals (PSSC) are present at the Range I, Parcel 201(7), site, and to provide data useful for supporting any future planned corrective measures and closure activities.
- Samples will be analyzed for the parameters listed in Section 4.5.

Range I, Parcel 201(7), falls within Pelham Range, which is an active range. Therefore, UXO surface sweeps and downhole surveys of soil borings will be required to support field activities at this site. The surface sweeps and downhole surveys will be conducted to identify anomalies for the purposes of UXO avoidance. The site-specific UXO safety plan will be used to support hazardous, toxic, and radiological waste investigation and construction activities at Range I, Parcel 201(7), should incidental ordnance, explosives, and/or UXO be encountered and require avoidance or disposal.

After completion of the field activities and sample analyses, draft and final SI summary reports will be prepared to summarize the results of the activities, to evaluate the absence or presence of PSSCs at this site, and to recommend further actions, if appropriate. SI sampling reports will be prepared in accordance with current U.S. Environmental Protection Agency (EPA) Region IV, and the Alabama Department of Environmental Management (ADEM) guidelines.

2.0 Summary of Existing Environmental Studies

An EBS was conducted by ESE to document current environmental conditions of all FTMC property (ESE, 1998). The study was to identify sites that, based on available information, have no history of contamination and comply with U.S. Department of Defense guidance for fast-track cleanup at closing installations. The EBS also provides a baseline picture of FTMC properties by identifying and categorizing the properties by the following seven criteria:

1. Areas where no storage, release, or disposal (including migration) has occurred
2. Areas where only release or disposal of petroleum products has occurred
3. Areas of contamination below action levels
4. Areas where all necessary remedial actions have been taken
5. Areas of known contamination with removal and/or remedial action underway
6. Areas of known contamination where required response actions have not been taken
7. Areas that are not evaluated or require further evaluation.

The EBS was conducted in accordance with the Community Environmental Response Facilitation Act (CERFA) (CERFA-Public Law 102-426) protocols and U.S. Department of Defense policy regarding contamination assessment. Record searches and reviews were performed on all reasonably available documents from FTMC, ADEM, EPA Region IV, and Calhoun County, as well as a database search of Comprehensive Environmental Response, Compensation, and Liability Act-regulated substances, petroleum products, and Resource Conservation and Recovery Act-regulated facilities. Available historic maps and aerial photographs were reviewed to document historic land uses. Personal and telephone interviews of past and present FTMC employees and military personnel were conducted. In addition, visual site inspections were conducted to verify the condition of specific property parcels.

Range I, Parcel 201(7), was identified as a Category 7 CERFA site. CERFA sites are parcels where site-specific chemicals were stored, and possibly released onto the site or to the environment and/or were disposed of on site property. Category 7 CERFA sites are areas that lack adequate documentation and therefore require additional evaluation to determine the environmental condition of the parcel.

According to Roy F. Weston, Inc. (1990), the Army collected surface soil samples for analysis for distilled mustard (HD) in 1979. The results did not indicate the presence of HD. The 1999 CHPPM draft report cites the ESE *Reassessment of FTMC Report, Anniston, Alabama, Report No. 110A* (ESE, 1984), which recommended that due to the possible existence of isolated

pockets of live agent, use of the subsurface (such as excavation activities) should be prohibited. Details of the Army sampling event, such as sample locations and collection techniques, were not provided.

Science Applications International Corporation (SAIC) conducted a SI of Range I, Parcel 201(7), in October 1991 and April 1992 (SAIC, 1993). During the SI, four soil samples were collected for field screening and laboratory analysis from two soil boring locations. The soil borings were advanced to a depth of 67 inches below ground surface (bgs). Two samples were collected from each soil boring; one sample from 9 to 12 inches bgs, and one sample from 60 to 67 inches bgs. The samples were labeled RI-S0101, RI-S0102, RI-S0201, and RI-S0202. The soil sample locations shown in Figure 2-1 were taken from the SAIC sample location map and projected onto the site map, as determined by IT. The samples were field screened using a Miniature Continuous Air Monitoring System (MINICAMS) analyzer for the presence of HD, GB, and nerve agents. The MINICAMS results, as shown in Table 2-1, did not indicate the presence of chemical warfare agents (CWAs). The soil samples were also laboratory analyzed for the degradation products of HD, GB, and nerve agents. The results of the laboratory analysis, summarized in Table 2-2, did not indicate the presence of CWAs in the soil samples.

IT conducted a surface geophysical survey at Range I, Parcel 201(7), at Pelham Range. The geophysical survey objectives were to screen the area for the presence of buried drums, or munitions suggested in historical reports. The site encompassed an area of approximately 40,000 square feet (0.92 acres).

The survey was conducted using magnetic and electromagnetic (EM) techniques. A survey grid was established at the site to encompass suspect area. Survey control was accomplished using a Trimble Pro XR sub-meter differential correction global positioning system (GPS). The civil survey data were referenced to the U.S. State Plane Coordinate System (Alabama East Zone, North American Datum [NAD] 1983). A detailed discussion of the geophysical investigation, including theory of operation of the instruments, field procedures, data processing, and interpreted results of the investigation are presented as Appendix A.

The geophysical survey results indicate that there are no anomalies at Range I, Parcel 201(7), at Pelham Range, which are indicative of buried metal drums or munitions. The geophysical interpretation map of the site (Figure A-2, Appendix A) contains detailed information on permanent site reference features as well as civil survey coordinates to aid in relocating the survey area.

A more detailed discussion of the data interpretation is included in the geophysics report (Chapter A.4.0, Appendix A).

3.0 Site-Specific Data Quality Objectives

3.1 Overview

The data quality objective (DQO) process is followed to establish data requirements. This process ensures that the proper quantity and quality of data are generated to support the decision-making process associated with the action selection for Range I, Parcel 201(7). This section incorporates the components of the DQO process described in the EPA publication 540-R-93-071, *Data Quality Objectives Process for Superfund* (EPA, 1993). The DQO process as applied to the Range I, Parcel 201(7), site is described in more detail in Section 4.3 of the WP. Table 3-1 provides a summary of the factors used to determine the appropriate quantity of samples, and the procedures necessary to meet the objectives of the SI and establish a basis for future action at this site.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Chapter 4.0 in this SFSP and Table 6-1 in the QAP (IT, 2000a). Data will be reported and evaluated in accordance with Corps of Engineers South Atlantic Savannah (CESAS) Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported via hard copy data packages by the laboratory using Contract Laboratory Program-like forms. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

3.2 Data Users and Available Data

The available data related to the SI at the Range I, Parcel 201(7), site have been used to formulate a site-specific conceptual model. This conceptual model was developed to support the development of this SFSP, which is necessary to meet the objectives of these activities and to establish a basis for future action at the site. The users for the data and information generated during field activities are primarily EPA, USACE, ADEM, FTMC, and the USACE supporting contractors. This SFSP, along with the necessary companion documents, has been designed to provide the regulatory agencies with sufficient detail to reach a determination as to the adequacy of the scope of work. The program has also been designed to provide the level of defensible data and information required to confirm or rule out the existence of residual chemical contamination in site media.

3.3 Conceptual Site Exposure Model

The conceptual site exposure model (CSEM) provides the basis for identifying and evaluating the potential risks and hazards to human health in the risk assessment. The CSEM includes

receptors and potential exposure pathways appropriate to all plausible scenarios. The CSEM facilitates consistent and comprehensive evaluation of human health through graphically presenting all possible exposure pathways, including sources, release and transport pathways, and exposure routes. In addition, the CSEM helps to ensure that potential pathways are not overlooked. The following are elements of a complete exposure pathway and CSEM:

- Source (i.e., contaminated environmental) media
- Contaminant release mechanisms
- Contaminant transport pathways
- Receptors
- Exposure pathways.

Contaminant release mechanisms and transport pathways are not relevant for direct receptor contact with a contaminated source medium.

Primary contaminant releases were probably limited to leaks and spills that entered surface soil. Potential contaminant transport pathways include infiltration and leaching to subsurface soil and groundwater, dust emissions and volatilization to ambient air, runoff and erosion to surface water and sediment, and biotransfer to deer through browsing.

Currently the site is used for training exercises, and access is unrestricted. A fence at the site is in disrepair. The site is covered with small pines and brush, and does not appear to be maintained in any fashion. Because trespassors or hunters may access the site, a recreational site user will be evaluated for the current land-use scenario. The following are additional potential receptors considered but not included under current land-use scenarios:

- ***Groundskeeper.*** The site is not currently maintained by a groundskeeper.
- ***Construction Worker.*** The site is unused, and no development or construction is occurring.
- ***Resident.*** The site is not currently used for residential purposes.

Future land use in this area is for an active range for training to be used by the National Guard. Since the future site use has not been designated or restricted, any future land use receptor scenarios are plausible. Thus, the following future land use receptor scenarios are included in the CSEM:

- ***Resident.*** Although the site is not expected to be utilized for residential purposes, the resident is considered in order to provide information for the project manager and regulators.

- ***Recreational Site User.*** Since the site future use is unknown and not restricted, and since hunting is a viable option, the recreational site user must be included. His exposure to sediment and surface water will also be evaluated. Fish ingestion will not be evaluated because the stream is too small to support fish which might be caught for consumption.

A summary of relevant contaminant release and transport mechanisms, source and exposure media, and receptors and exposure pathways for this site is provided in Table 3-1 and Figure 3-1.

3.4 Decision-Making Process, Data Uses, and Needs

The decision-making process consists of a seven-step process that is presented in detail in Section 4.3 of the WP and will be followed during the SI at Range I, Parcel 201(7). Data uses and needs are summarized in Table 3-1.

3.4.1 Risk Evaluation

Confirmation of contamination at Range I, Parcel 201(7), will be based on comparing detected site chemicals of potential concern to site-specific screening levels developed in the *Final Human Health and Ecological Screening Values and PAH Background Summary Report* (IT, 2000b). EPA definitive data with CESAS Level B data packages will be used to determine whether or not PSSCs are detected in site media. Definitive data will be adequate for confirming the presence of site contamination and for supporting a feasibility study and risk assessment.

Assessment of potential ecological risk associated with sites or parcels (e.g., surface water and sediment sampling, specific ecological assessment methods, etc.) will be addressed in accordance with the procedures in the WP.

3.4.2 Data Types and Quality

Surface soil, subsurface soil, groundwater, surface water, and sediment samples will be sampled and analyzed to meet the objectives of the SI at Range I, Parcel 201(7). Quality assurance/quality control (QA/QC) samples will be collected for all sample types as described in Chapter 4.0 of this SFSP. Samples will be analyzed by EPA-approved SW-846 Methods Update III, where available; comply with EPA definitive data requirements; and be reported using hard copy data packages. In addition to meeting the quality needs of this SI, data analyzed at this level of quality are appropriate for all phases of site characterization, remedial investigation, and risk assessment.

3.4.3 Precision, Accuracy, and Completeness

Laboratory requirements of precision, accuracy, and completeness for this SI are provided in Section 9.0 of the QAP.

4.0 Field Activities

4.1 UXO Survey Requirements and Utility Clearances

Range I, Parcel 201(7), falls within Pelham Range, which is an active range. Therefore, UXO surface sweeps and downhole surveys of soil borings will be required prior to intrusive sampling to support field activities at this site. The site-specific UXO safety plan provides technical guidance for ordnance and explosives avoidance and construction activities for sample collection activities at Range I, Parcel 201(7). The site-specific UXO safety plan attachment has been written in conjunction with Appendix E of the SAP (IT, 2000a). After UXO surface sweep area clearing and before any sample collection, a utility clearance will be performed at potential sample locations.

4.1.1 Surface UXO Survey

A UXO sweep will be conducted over areas that will be included in the sampling and surveying activities to identify UXO on or near the surface that may present a hazard to on-site workers during field activities. Low-sensitivity magnetometers will be used to locate surface and shallow-buried metal objects. UXO located on the surface will be identified and conspicuously marked for easy avoidance. Subsurface metallic anomalies will not be disturbed, and will also be marked for easy avoidance. UXO personnel requirements, procedures, and detailed descriptions of the geophysical equipment to be used are provided in Chapter 4.0 and Appendices D and E of the approved SAP (IT, 2000a).

4.1.2 Downhole UXO Survey

During the soil boring and downhole sampling, downhole UXO surveys will be performed to determine if buried metallic objects are present. UXO monitoring, as described in Chapter 4.0 of the SAP (IT, 2000a), will continue until undisturbed soils are encountered or the borehole has been advanced to 12 feet bgs, whichever is reached first.

4.1.3 Utility Clearances

After the UXO surface survey, and prior to any intrusive sampling, a utility clearance will be performed at locations where soil and groundwater samples will be collected using the procedure outlined in Section 4.2.6 of the SAP (IT, 2000a). The site manager will mark the proposed locations with stakes, coordinate with the local utility companies to clear the proposed locations for utilities, and obtain digging permits. Once the locations are approved (for both UXO and utility avoidance) for intrusive sampling, the stakes will be labeled as cleared.

4.2 Environmental Sampling

The environmental sampling program at the Range I, Parcel 201(7), site includes the collection of surface soil, subsurface soil, groundwater, surface water, and sediment samples for chemical analyses. These samples will be collected and analyzed to provide data for characterizing the site. This information will be used to determine both the environmental condition of the site and any further action to be conducted there. Additionally, samples will be collected from environmental media in locations that will assist in the assessment of potential ecological impacts resulting from activities at the site.

4.2.1 Surface Soil Sampling

Surface soil samples will be collected from ten locations at Range I, Parcel 201(7).

4.2.1.1 Sample Locations and Rationale

The surface soil sampling rationale are listed in Table 4-1. Proposed sampling locations are shown in Figure 4-1. Surface soil sample designations and required QA/QC sample requirements are summarized in Table 4-2. The final soil boring sampling locations will be determined in the field by the on-site geologist based on actual field conditions.

4.2.1.2 Sample Collection

Surface soil samples will be collected from the upper 1 foot of soil by direct-push methodology as specified in Section 4.7.1.1 of the SAP (IT, 2000a). Collected soil samples will be screened using a photoionization detector (PID) in accordance with Section 4.15 of the SAP. Surface soil samples will be screened for information purposes only, not to aid the selection of samples for analysis. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1, of the QAP. Sample documentation and chain-of-custodies (COC) will be recorded as specified in Section 4.13 of the SAP. The samples will be analyzed for the parameters listed in Section 4.6 of this SFSP.

4.2.2 Subsurface Soil Sampling

Subsurface soil samples will be collected from ten borings installed at Range I, Parcel 201(7).

4.2.2.1 Sample Locations and Rationale

Subsurface soil samples will be collected from the soil borings proposed on Figure 4-1. The subsurface soil sampling rationale is listed in Table 4-1. Subsurface soil samples to be collected are listed in Table 4-2. The final soil boring sampling locations will be determined in the field

by the on-site geologist, based on actual field observations, utility clearance results, and results of the geophysical survey.

4.2.2.2 Sample Collection

Subsurface soil samples will be collected from soil borings at a depth greater than 1 foot bgs in the unsaturated zone. The soil borings will be advanced and soil samples collected using direct-push methodology as specified in Section 4.7.1.1 of the SAP (IT, 2000a).

Soil samples will be collected continuously for the first 12 feet or until either groundwater or refusal is reached. A detailed lithogical log will be recorded by the on-site geologist for each borehole. At least one subsurface sample from each borehole will be selected for analysis. The collected subsurface soil samples will be field screened using a PID in accordance with Section 4.15 of the SAP to measure samples exhibiting elevated readings exceeding background (readings in ambient air). Typically, the subsurface soil sample showing the highest reading (above background) will be selected and sent to the laboratory for analysis. If none of the samples indicate readings exceeding background using the PID, the deepest interval above the groundwater table from the soil boring will be sampled and submitted to the laboratory for analysis. Subsurface soil samples may be selected for analysis from any depth interval if the on-site geologist suspects PSSCs at the interval. Site conditions such as lithology may also determine the actual sample depth interval submitted for analysis. More than one subsurface soil sample will be collected if field measurements and observations indicate a possible layer of PSSCs and/or additional sample data would provide insight to the existence of any PSSCs.

Sample documentation and COCs will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP. The samples will be analyzed for the parameters listed in Section 4.6 of this SFSP.

4.2.3 Permanent Residuum Monitoring Wells

Four permanent residuum monitoring wells will be installed at the Range I, Parcel 201(7) site. The permanent residuum monitoring well locations are shown on Figure 4-1. The rationale for the monitoring well locations are presented in Table 4-1. The monitoring well boreholes will be drilled at least 10 feet into the first water encountered or to the top of bedrock, whichever is encountered first. The monitoring well will be installed with a 10 to 20-foot screen. Based on site-specific geology, a 3 to 5-foot sump may be installed. Monitoring wells will be installed using a truck-mounted hollow-stem auger drill rig. The monitoring well casing will consist of

new 2-inch inside diameter, Schedule 40, threaded, flush joint, polyvinyl chloride pipe. Attached to the bottom of the well casing will be a section of new threaded, flush joint, 0.010-inch continuous wrap polyvinyl chloride well screen, approximately 10 to 20 feet long. The well will be installed so the well screen intersects the water table.

In order to provide a detailed lithologic log, soil samples for lithology will be collected continuously every 5 feet to the total depth of the hole during hollow-stem auger drilling. Lithologic samples will be collected using a 24-inch-long, 2-inch-or-larger-diameter, split-spoon sampler. The soil borings will be logged in accordance with American Standard for Testing and Materials Method D 2488 using the Unified Soil Classification System. The soil samples will be screened in the field using a PID. The monitoring wells will be drilled, installed, and developed as specified in Section 4.8 and Appendix C of the SAP (IT, 2000a). The exact monitoring well locations will be determined in the field by the on-site geologist based on actual field conditions.

4.2.4 Groundwater Sampling

Groundwater samples will be collected from the four monitoring wells completed at Range I, Parcel 201(7), as presented in Section 4.3.3.

4.2.4.1 Sample Locations and Rationale

Groundwater samples will be collected from the monitoring well locations shown on Figure 4-1. The groundwater sampling rationale is listed in Table 4-1. The groundwater sample designations, depths, and required QA/QC sample quantities are listed in Table 4-3.

4.2.4.2 Sample Collection

Prior to sampling monitoring wells, static groundwater levels will be measured from each of the four monitoring wells installed at the site to define the groundwater flow in the residuum aquifer. Groundwater level measurements will be performed as outlined in Section 4.18 of the SAP (IT, 2000a). Groundwater samples will be collected in accordance with the procedures outlined in Section 4.9.1.4 of the SAP.

Sample documentation and COCs will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP (IT, 2000a). The samples will be analyzed for the parameters listed in Section 4.6 of this SFSP.

4.2.5 Surface Water Sampling

Three surface water samples will be collected from the site of Range I, Parcel 201(7).

4.2.5.1 Sample Locations and Rationale

The surface water sampling rationale are listed in Table 4-1. The surface water samples will be collected from the proposed locations on Figure 4-1. The surface water sample designations and requisite QA/QC sample requirements are listed in Table 4-4. The proposed surface water sample locations are shown on Figure 4-2. The exact sampling locations will be determined in the field by the ecological sampler based on drainage pathways and actual field observations.

4.2.5.2 Sample Collection

The surface water samples will be collected in accordance with the procedures specified in Section 4.9.1.3 of the SAP (IT, 2000a). Sample documentation and COCs will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1, of the QAP. The samples will be analyzed for the parameters listed in Section 4.6 of this SFSP.

4.2.6 Sediment Sampling

Three sediment samples will be collected from the site of Range I, Parcel 201(7). These sediment samples will be collected at the same locations as the surface water samples described in Section 4.2.6.

4.2.6.1 Sample Locations and Rationale

The proposed locations for the sediment samples are shown in Figure 4-2. Sediment sampling rationale are presented in Table 4-1. The sediment sample designation and required QA/QC sample requirements are listed in Table 4-4. The actual sediment sample locations will be at the discretion of the ecological sampler based on the drainage pathways and actual field observations.

4.2.6.2 Sample Collection

The sediment samples will be collected in accordance with the procedures specified in Section 4.9.1.2 of the SAP. Sediment samples for volatile organic analysis will be collected in EnCore sampling devices. Sample documentation and COCs will be recorded as specified in Section 4.13 of the SAP. The sediment samples will be analyzed for the parameters listed in Section 4.6 of this SFSP.

4.3 Decontamination Requirements

Decontamination will be performed on sampling and nonsampling equipment to prevent cross-contamination between sampling locations. Decontamination of sampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.1 of the SAP (IT, 2000a). Decontamination of nonsampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.2 of the SAP.

4.4 Surveying of Sample Locations

Sampling locations will be marked with pin flags, stakes, and/or flagging and will be surveyed using either GPS or conventional civil survey techniques, as necessary, to obtain the required level of accuracy. Horizontal coordinates will be referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum, 1983. Elevations will be referenced to the North American Vertical Datum of 1988.

Horizontal coordinates for soil, sediment, and surface water locations will be recorded using a GPS to provide accuracy within 1 meter. Because of the need to use permanent monitoring wells to determine water levels, a higher level of accuracy is required. Monitoring wells will be surveyed to an accuracy of 0.1 foot for horizontal coordinates and 0.01 foot for elevations, using survey grade GPS techniques and/or conventional civil survey techniques, as required. Procedures to be used for GPS surveying are described in Section 4.3 of the SAP. Conventional land survey requirements are presented in Section 4.19 of the SAP.

4.5 Analytical Program

Samples collected at locations specified in this chapter of this SFSP will be analyzed for the specific suites of chemicals and elements based on the history of site usage, as well as EPA, ADEM, FTMC, and USACE requirements. Target analyses for samples collected from Range I, Parcel 201(7), consist of the following list of analytical suites:

- Target compound list volatile organic compounds – Method 5035/8260B
- Target compound list semivolatile organic compounds – Method 8270C
- Target analyte list metals – Method 6010B/7000
- Nitroexplosives – Method 8330
- Chemical warfare material breakdown products – Method 8270M/8321
- Arsenic speciation – Method 8270 MOD

In addition, the sediment samples will be analyzed for the following list of parameters:

- Total organic carbon – Method 9060

- Grain size – ASTM D-421/D-422.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Table 4-5 in this SFSP and Table 6-1 in the QAP. Data will be reported and evaluated in accordance with CESAS Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported via hard copy data packages by the laboratory using Contract Laboratory Program-like forms and electronic copies. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

4.6 Sample Preservation, Packaging, and Shipping

Sample preservation, packaging, and shipping will follow the procedures specified in Section 4.13.2 of the SAP (IT, 2000a). Completed analysis request/COC records will be secured and included with each shipment of coolers to:

Attn: Elizabeth McIntyre
EMAX Laboratories, Inc.
630 Maple Avenue
Torrance, California 90503
Telephone: (310) 618-8889.

4.7 Investigation-Derived Waste Management

Management and disposal of the investigation-derived wastes (IDW) will follow procedures and requirements as described in Appendix D of the SAP (IT, 2000a). The IDW generated at the Range I, Parcel 201(7) site is expected to include decontamination fluids and disposable personal protective equipment. The IDW will be staged in roll-off storage containers at the site. Composite soil samples will be collected and analyzed. Nonhazardous soils will either be disposed at the Borrow Pit at Pelham Range or transported back to the Main Post and disposed at the Industrial Landfill. Hazardous soils will be transported by a licensed waste hauler to an approved facility for either treatment or disposal.

4.8 Site-Specific Safety and Health

Health and safety requirements for this SI are provided in the SSHP attachment for Range I, Parcel 201(7). The SSHP attachment will be used in conjunction with the installation-wide safety and health plan.

5.0 Project Schedule

The project schedule for the SI activities will be provided by the IT Project Manager to the Base Realignment and Closure Cleanup Team and will be in accordance with the WP.

6.0 References

Environmental Science and Engineering, Inc. (ESE), 1998, ***Final Environmental Baseline Survey, Fort McClellan, Alabama***, prepared for U.S. Army Environmental Center, Aberdeen Proving Ground, Maryland, January.

Environmental Science and Engineering, Inc. (ESE), 1984, ***Reassessment of Fort McClellan, Anniston, Alabama, Report No. 110A***, January.

Fort McClellan (FTMC), 1997, ***Fort McClellan Comprehensive Reuse Plan***, Fort McClellan Reuse and Redevelopment Authority of Alabama, prepared under contract to the Calhoun County Commission, November.

IT Corporation (IT), 2000a, ***Final Installation-Wide Sampling and Analysis Plan, Fort McClellan, Calhoun County, Alabama***, March.

IT Corporation (IT), 2000b, ***Final Human Health and Ecological Screening Values and PAH Background Summary Report***, July.

IT Corporation (IT), 1998, ***Final Installation-Wide Work Plan, Fort McClellan, Calhoun County, Alabama***, August.

Science Applications International Corporation (SAIC), 1993, ***Site Investigation Report, Fort McClellan, Alabama***, August 31.

U.S. Army Center for Health Promotion and Preventive Medicine (CHPPM), 1999, ***Draft Preliminary Assessment No. 38-EH-1775-99, Fort McClellan Army National Guard Training Center, Fort McClellan, Alabama***, May 28 – June 17.

U.S. Army Corps of Engineers (USACE), 2000, ***Statement of Work for Task Order CK05, Modification No. 10, National Guard Memorandum of Agreement Sites, Fuel/Training Areas SI, Waste Chemical Storage Area SI, Fire Training Pit SI, Industrial Landfill Remedial Design, UST Review, Range J RI, and Partnering Facilities at Fort McClellan, Alabama***, September.

U.S. Army Corps of Engineers (USACE), 1994, ***Requirements for the Preparation of Sampling and Analysis Plan***, Engineer Manual EM 200-1-3, September 1.

U.S. Army Toxic and Hazardous Materials Agency, 1977, ***Installation Assessment of Fort McClellan, Report No. 110, Volume I of II***, April.

U.S. Department of Agriculture, 1961, ***Soil Survey, Calhoun County, Alabama***, Soil Conservation Service, Series 1958, No. 9, September.

U.S. Environmental Protection Agency (EPA), 1993, ***Data Quality Objectives Process for Superfund, Interim Final Guidance***, EPA 540-R-93-071, September.

Roy F. Weston, Inc., 1990, ***Final USATHAMA Task Order 11, Enhanced Preliminary Assessment, Fort McClellan, Anniston, Alabama***, prepared for U.S. Army Toxic and Hazardous Materials Agency, Aberdeen Proving Ground, Maryland, December.

ATTACHMENT 1

LIST OF ABBREVIATIONS AND ACRONYMS

APPENDIX A

DRAFT GEOPHYSICAL SURVEY REPORT
RANGE I, PARCEL 201(7)